CLAIMS

What is claimed is:

1. A processing method for generating a 3D texture model, wherein there are processes of:

obtaining a 3D geometrical model expressing a 3D form of an object by using geometrical information:

obtaining geographic information including latitude and longitude indicating a position of said object and orientation of the object;

obtaining image data of said object shot with the sun as a light source and correspondence information indicating correspondence between a scene expressed by said image data and said 3D geometrical model as to their positions and forms;

obtaining shooting information including information on a shooting time and shooting situation of said image data;

placing said 3D geometrical model in a predetermined local coordinate system based on said geographic information, and calculating a light source direction in said local coordinate system by using said geographic information and said shooting time;

detecting a shadow region cast on a surface of said 3D geometrical model by a beam in said light source direction by using said light source direction so as to identify the shadow region of said image data based on said correspondence information;

using a predetermined reflection model to estimate effects of shadings

caused to said 3D geometrical model by the beam in said light source

direction, and determining a parameter of the reflection model suited to said

estimated shadings; and

performing calculation for removing the effects of the shadows and

shadings by using said parameter from pixel values sampled from said

image data based on said correspondence information so as to fit said

calculated pixel values in said 3D geometrical model.

2.   A processing apparatus for generating a 3D texture model, wherein

the apparatus comprises:

processing means for storing a 3D geometrical model expressing a 3D

form of an object by using geometrical information:

processing means for storing geographic information including

latitude and longitude indicating a position of said object and orientation of

the object;

processing means for storing image data of said object shot with the

sun as a light source and correspondence information indicating

correspondence between a scene expressed by said image data and said 3D

geometrical model as to their positions and forms;

storing means for storing shooting information including information

on a shooting time and shooting situation of said image data;

processing means for placing said 3D geometrical model in a

predetermined local coordinate system based on said geographic information,

and calculating a light source direction in said local coordinate system by using said geographic information and said shooting time;

processing means for detecting a shadow region cast on a surface of said 3D geometrical model by a beam in said light source direction by using said light source direction so as to identify the shadow region of said image data based on said correspondence information;

processing means for using a predetermined reflection model to estimate effects of shadings caused to said 3D geometrical model by the beam in said light source direction, and determining a parameter of the reflection model suited to said estimated shadings; and

processing means for performing calculation for removing the effects of the shadows and shadings by using said parameter from pixel values sampled from said image data based on said correspondence information so as to fit said calculated pixel values in said 3D geometrical model.

3. A recording medium having recorded a program for causing a computer to execute processes for generating a 3D texture model, wherein the program causes the computer to execute the processes of:

obtaining a 3D geometrical model expressing a 3D form of an object by using geometrical information:

obtaining geographic information including latitude and longitude indicating a position of said object and orientation of the object;

obtaining image data of said object shot with the sun as a light source

and correspondence information indicating correspondence between a scene expressed by said image data and said 3D geometrical model as to their positions and forms;

obtaining shooting information including information on a shooting time and shooting situation of said image data;

placing said 3D geometrical model in a predetermined local coordinate system based on said geographic information, and calculating a light source direction in said local coordinate system by using said geographic information and said shooting time;

detecting a shadow region cast on a surface of said 3D geometrical model by a beam in said light source direction by using said light source direction so as to identify the shadow region of said image data based on said correspondence information;

using a predetermined reflection model to estimate effects of shadings caused to said 3D geometrical model by the beam in said light source direction, and determining a parameter of the reflection model suited to said estimated shadings; and

performing calculation for removing the effects of the shadows and shadings by using said parameter from pixel values sampled from said image data based on said correspondence information so as to fit said calculated pixel values in said 3D geometrical model.